

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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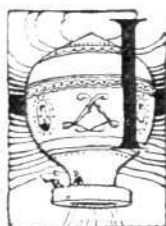
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EDITORIAL COMMENT.



IN some ways it seems rather regrettable that what is undoubtedly the finest aerial display of the year is nearly always the first aviation meeting of the season. Thus the general public, ever in the habit of losing interest in flying during the winter months, has scarcely begun again to think about visiting aerodromes. If the Royal Air Force Pageant were held a little later in the season, after one or two "civilian" meetings had taken place, interest would already have been aroused, and more visitors might find their way to Hendon to see the "Great Air Force Show." On the other hand, the thousands of people who flock to Hendon to see the Pageant invariably come away filled with enthusiasm, and doubtless help very materially in "spreading the gospel" whenever another aviation meeting is being held later in the season, to the benefit of the R.Ae.C. and to flying in general.

Be that as it may, on Saturday of this week, June 28, the Fifth R.A.F. Pageant will be held at the Hendon Aerodrome, and will, as far as can be judged, fully equal in spectacular display the four pageants which have preceded it. It is now a fact well known to all who take an interest in flying that nowhere in the world does one see prettier flying, more skilful handling of machines, nor better organisation than at the Royal Air Force Pageant. Thus, even those actuated by nothing more keen than that of enjoying themselves have good excuse for visiting Hendon on June 28. It should be remembered, however, that there is another reason, in fact several others, for being present at the Pageant. This annual display is the Royal Air Force equivalent of the military tournament at Olympia, and to those who seriously have the future of the Royal Air Force at heart the Pageant provides a reasonably good indication of the progress made from year to year, not only in flying skill, but, what is, perhaps, more important, in the production of new types.

While on this subject we cannot refrain from pointing

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1924

- June 28 Royal Air Force Pageant, Hendon
- July 24-Aug. 10 Tour de France for Light 'Planes
- Aug. 4 Aerial Derby at Lympe
- „ 4 Holiday Light Aeroplane Handicap at Lympe
- „ 12 King's Cup Race
- Sept. 8-13 Light 'Plane Competitions at Lympe
- Oct. 2 Aero Golfing Society. Autumn Meeting, at Moor Park Golf Club, for A.G.S. Challenge Cup presented by Cellon (Richmond) Ltd.
- October Schneider Cup Race, Baltimore, U.S.A.

out that in the matter of new types of service aircraft this year's Pageant looks like being a disappointment. So far as we have been able to ascertain, not a single aeroplane that can truly be termed a new type will be present at the Pageant. Most of the machines taking part in the various displays are at least three or four years old, while even in the "fly-past" there will not, it seems, be anything which has not taken part for at least two years, if we except the Parnall "Pixie" and de Havilland 53 light 'planes, neither of which are service machines, and the Gloucestershire "Grebe II," Hawker "Woodcock" and de Havilland "Dormouse." The "Grebe II" is presumably a development of the "Grebe I" which took part last year and which flew to Gothenburg. This is, therefore, a long way from being a novelty. The Hawker "Woodcock" is undoubtedly a new type, with, it is believed, quite a startling performance. Had the Air Ministry so chosen, there is, however, no reason why this machine should not have taken part in at least one previous Pageant. The de Havilland "Dormouse" is at least a year old as regards its original inception. There is not the slightest doubt that if those responsible for deciding upon the choice and acceptance of new types could be persuaded to make up their minds a little more rapidly, and the technical departments leave it more to individual private designers to produce the right machines, Saturday's "fly-past" would have been a vastly more interesting demonstration than it is now likely to be. However, the position in this respect is gradually getting so bad that the present system is bound sooner or later to bring about its own demise, and then, it is to be hoped, our designers may be given the opportunity for which they have been waiting to show what they really can do.

Apart from the various displays, and the bombing of an armed cruiser, the "feature" of next Saturday's Pageant will be the participation, for the first time in history, by a French *escadrille* of Nieuport-Delage single-seaters, type 29 C.1. These machines, although

the type is now several years old, are still among the finest single-seaters in the world for their power (they are fitted with 300 h.p. Hispano-Suiza engines), and the "aces" who will pilot them may be relied upon to show off the machines to the best advantage. That arrangements should have been made for a French *escadrille* to take part is not, it is understood, unconnected with the visit recently paid to French air stations and establishments by a British mission. This mission went to France at the invitation

of the French Air Minister, and we believe we are correct in stating that the chief object of the French was to convince representatives of the British air service that France's aerial preparations were certainly not directed against this country. It would appear that the visit by the French pilots may be taken as an indication that the British mission came away with an impression of perfectly good faith on the part of France, and the participation by the French *escadrille* is bound to bring closer together the air services of the two great allied nations. We congratulate the Air Ministry on having been able to arrange this visit, and we feel sure that a reception worthy of the occasion will be given the French pilots and their mechanics, not only by the Royal Air Force, but by the general public.

Finally, may we remind our readers

that the proceeds of the Royal Air Force Pageant are devoted to various charities in connection with the R.A.F., and that therefore, it behoves every one who can beg, borrow, or steal a conveyance of some sort to fill the enclosures at Hendon to overflowing. The "show" is the finest aerial display in the world, and the benefits of it are devoted to the worthiest of purposes. Therefore, let all the world and his wife make a point of going to the Pageant on June 28.

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One-Day Flight Across America

Lieut. R. L. Maughan, U.S. Army Air Service, on June 23 flew from New York to San Francisco, in 21 hrs. 49 mins. (18 hrs. 26 mins. flying time) on a Curtiss "Pursuit" plane.



The R.A.F. Pageant Poster, by Victor Fitzgerald. The poster depicts the principal "set-piece" of the R.A.F. Pageant, the aerial torpedoing of an enemy armed-merchant-cruiser. Some details of the Pageant programme are given on p. 405, *et seq.*

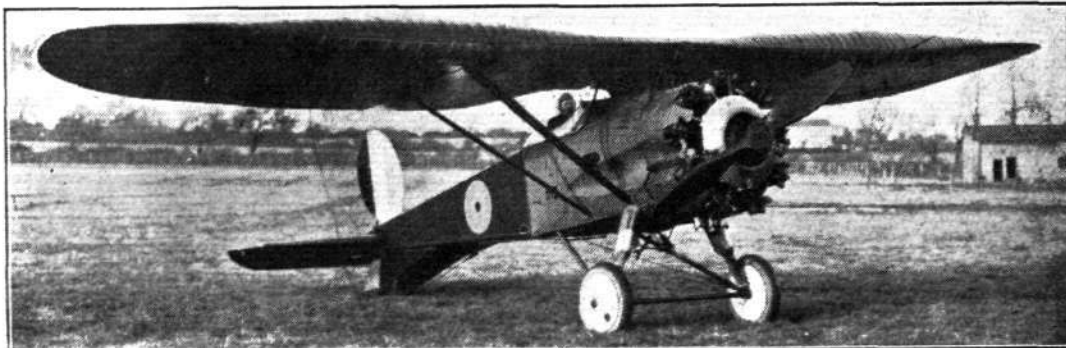
THE R.A.F. AERIAL PAGEANT

A Good Programme Promised Saturday's Visitors to Hendon

ON Saturday next, June 28, the Royal Air Force Pageant celebrates its fifth birthday at Hendon Aerodrome. From the preparations that have been in progress during the past few days—or weeks, for that matter—it would seem that this year's programme will have every chance of achieving

tinguished company, fully representative of the Government, the Services and others interested in flying. The Prime Minister has accepted the Air Council's invitation to be present, and other members of the Cabinet, who have already intimated their intention of being the guests of Lord Thomson,

At the Pageant:
The Bristol
"Bullfinch": A
single-seater
fighter mono-
plane fitted with
a 400 h.p. Bristol
"Jupiter" en-
gine.

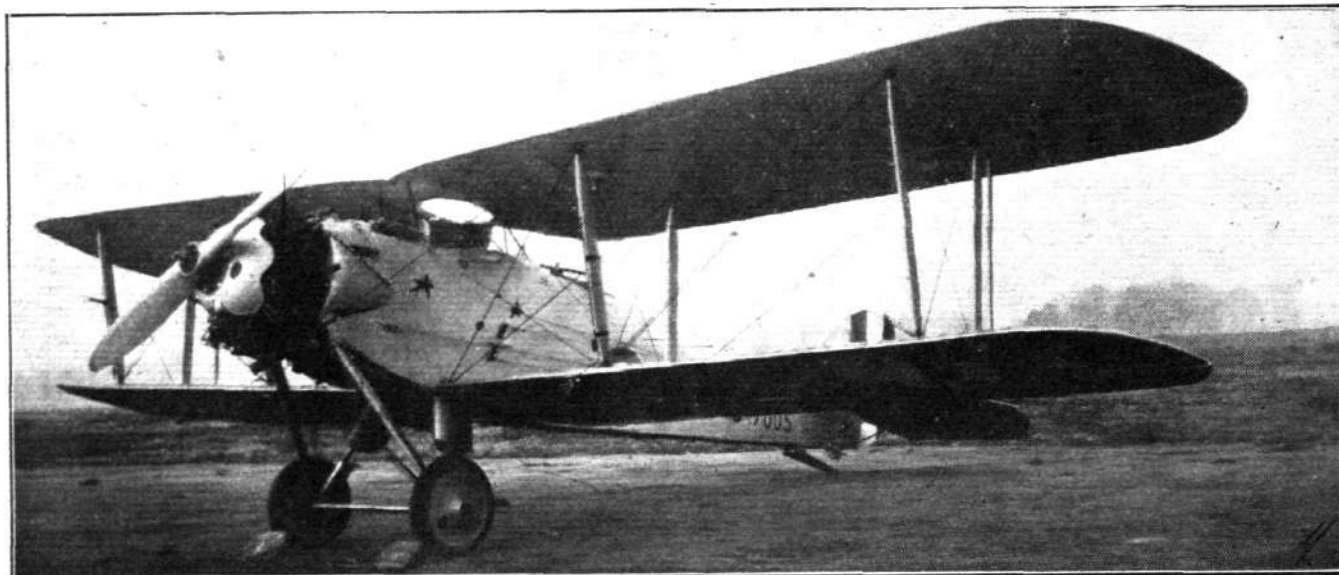


what many would call the impossible, viz., of being even better and more popular than all previous programmes. Well, let us see, and so come along in your thousands!

Although Their Majesties the King and Queen are unable

Secretary of State for Air, are Mr. J. H. Thomas, M.P., Secretary of State for the Colonies, and Mr. C. P. Trevelyan, M.P., President of the Board of Education.

A special enclosure has been reserved for members of the



At the Pageant: THE DE HAVILLAND "DORMOUSE": A recent "hush-hush" two-seater fighter biplane.

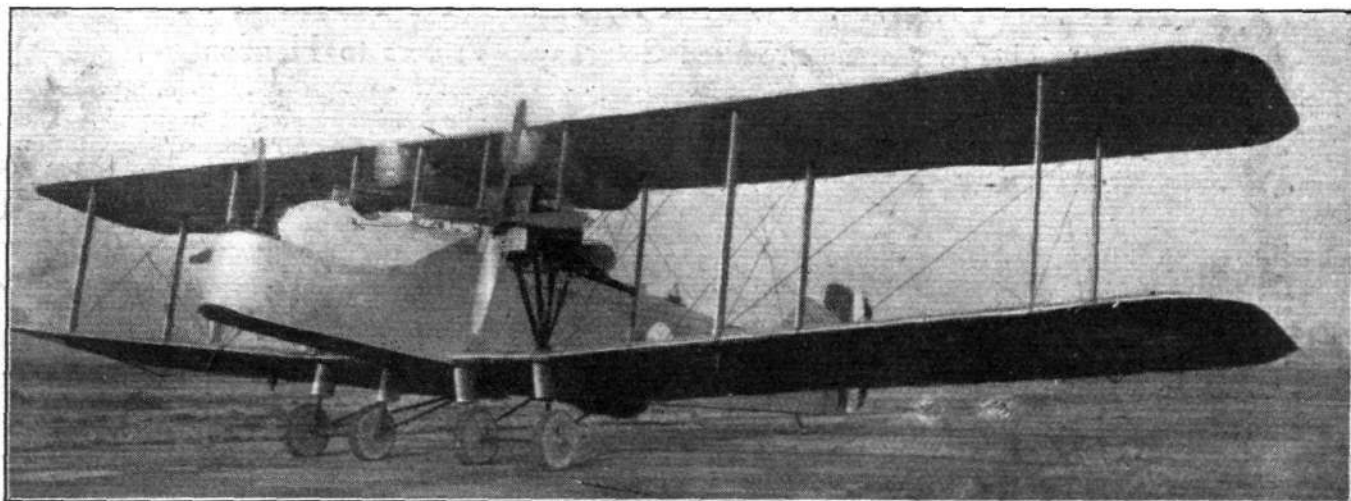
to be present this year, the Royal Family will be represented by the Duke of Connaught and the Duke of York, who is Patron of the Pageant. The Duchess of York will probably also attend. Supporting them will be a large and dis-

House of Commons, and so large has been the demand for tickets that it is expected that nearly half of the Members of the "House" will be present—each party being strongly represented.



At the Pageant:
The Gloucestershire
"Grebe": A high-speed
single-seater
fighter biplane
fitted with a Sid-
deley "Jaguar"
engine.

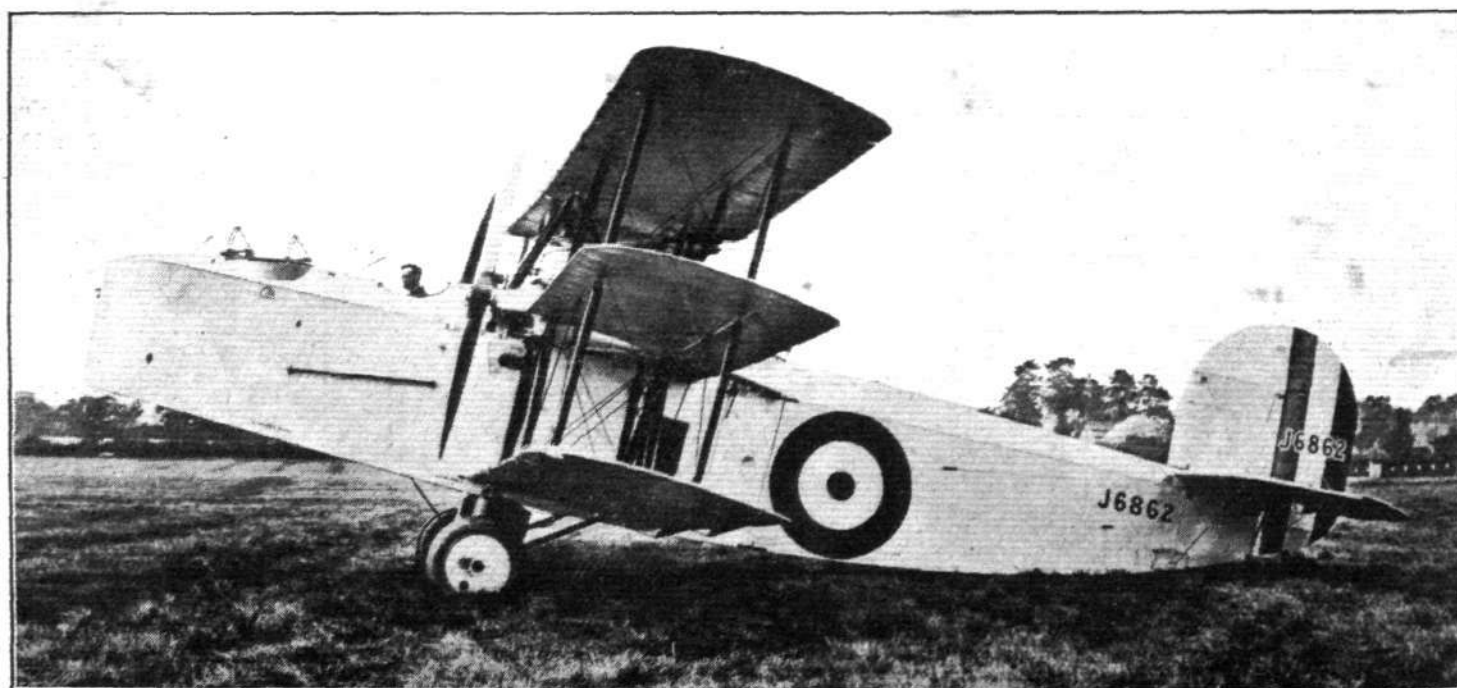
AT THE PAGEANT



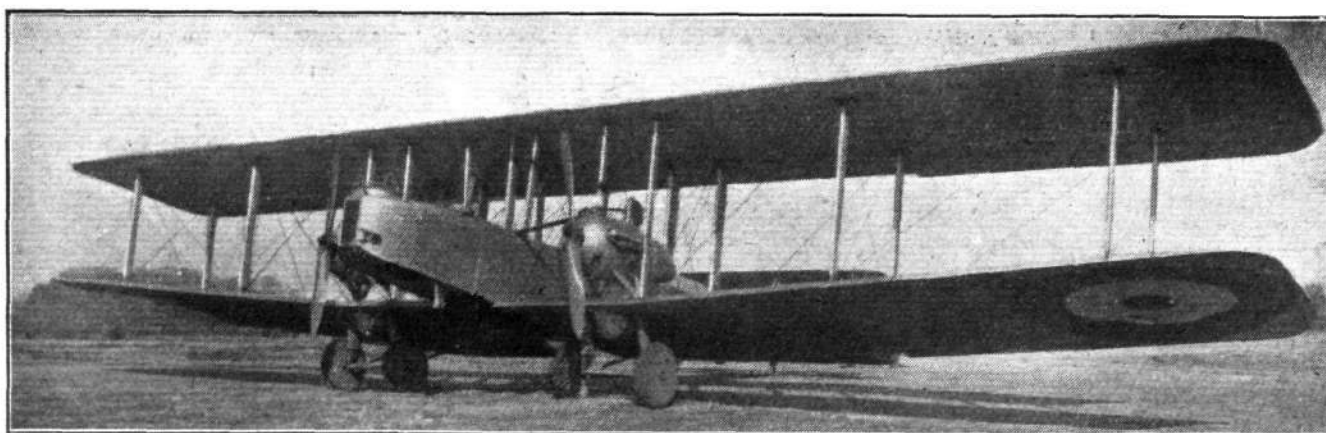
THE HANDLEY PAGE "HYDERABAD": A twin-engined ("Lion") bombing biplane—a Service edition of the famous commercial "W.8.B's."



THE HAWKER "WOODCOCK": Another recent single-seater fighter biplane, fitted with a Bristol "Jupiter."



THE PARNALL "POSSUM": This machine is of special interest not only on account of being a triplane, but because its Napier "Lion" engine is housed within the fuselage, and drives the airscrews on the wings through gear transmission.



THE VICKERS "VIRGINIA": A large twin-engined ("Lion") bombing biplane—the latest version of the world-famous "Vimy."

The following is a provisional list of the events down on the programme:—

Message Picking-up Competition, in which No. 2 (Co-op.), No. 4 (Co-op.), No. 13 (Co-op.) squadrons and the School of Army Co-operation will take part. This event should be of special interest just now, as Sir J. M. Salmond made particular reference to this method of communication in his recent dispatch on the British operations in Kurdistan. This operation is now a normal part of the duty of army co-operation squadrons, and consists of an aircraft picking up a message bag which is suspended from a wire slung between two poles.

Standard Avro Race: An extremely popular event, full of interest and excitement, in which more than a dozen Avros start off at the same time and fly over a course within view from start to finish—a real race.

Fly past of new and experimental machines.—Another interesting event; some of the machines taking part are as follows: Avro "Andover," an aerial ambulance; Bristol

Wing Flying Drill by two squadrons (Nos. 39 and 207) of D.H. 9A's. A very spectacular and wonderful display.

Display of "Aerobatics" by five Sopwith "Snipes" from the Central Flying School.

Low flying attack on tank by No. 25 (Fighter) Squadron.

Display by Coastal Area (Gosport and Leuchars). This is the "star turn," and the story is as follows:—

A British tramp steamer, loaded with foodstuffs, is proceeding on her way to the port of London when she is stopped by an enemy armed merchant cruiser. A pinnace is lowered from the commerce destroyer, and enemy officers board the tramp with a view to securing its papers and sinking it with explosives. At this period the situation is observed by a Supermarine "Seagull" amphibian, which is engaged on reconnaissance duties, and which reports immediately by wireless to its base.

While the enemy crew is engaged on its work of destruction a formation of Fairey "Flycatcher" ship fighters appears and attacks the commerce destroyer, clearing the decks and



The Visitor from France: The Nieuport-Delage single-seater "Avion de Chasse," type 29 C.1, fitted with a 300 Hispano-Suiza.

"Bullfinch" (Bristol "Jupiter"), a single-seater fighter monoplane; De Havilland "Dormouse," a fighter-reconnaissance biplane; Gloucestershire "Grebe II" (Armstrong-Siddeley "Jaguar"), a single-seater fighter biplane; Handley Page "Hyderabad" ((2) Napier "Lions"), a bombing biplane; one of the new three-engined Handley Page biplanes will also be present; Hawker "Woodcock" (Bristol "Jupiter"), a single-seater fighter biplane; Parnall "Possum" (Napier "Lion"), a triplane with gear transmission to wing airscrews; Vickers "Venture" (Napier "Lion"), a two-seater fighter biplane; and Vickers "Virginia" ((2) Napier "Lions"), a large bombing biplane. Light planes will be represented by the De Havilland "53" and the Parnall "Pixie."

Flying display by the French Squadron, made up of famous French "Aces," on Nieuport-Delage 29-C.1 fighters, led by Commandant Gastin.

Relay Race.—Another popular event in which various air stations take part.

silencing the anti-aircraft guns with machine gun fire. Following them comes a formation of five Blackburn "Dart" torpedo-carrying aircraft, which proceed to launch their torpedoes. Several effective hits are made, setting fire to the vessel and causing her to heel over in a sinking condition. Their task completed the aircraft return to their base. The gates open at 11 a.m., and from noon until 3 p.m., when the programme officially starts, plenty of flying will be in progress.

Tickets for the various enclosures cost 2s., 5s. and 10s. respectively, but the first-mentioned can only be obtained at the aerodrome on the day of the Pageant. Car tickets, which include the admission of the chauffeur, are 5s. Cars should approach Hendon aerodrome *via* Edgware Road and Colindale Avenue as special arrangements have been made to facilitate car traffic by this route.

Last, but not least, the proceeds of the Pageant go to R.A.F. charities, so, as we said before, come to Hendon on Saturday in your thousands!

THE
THIRD

 INTER-
NATIONAL

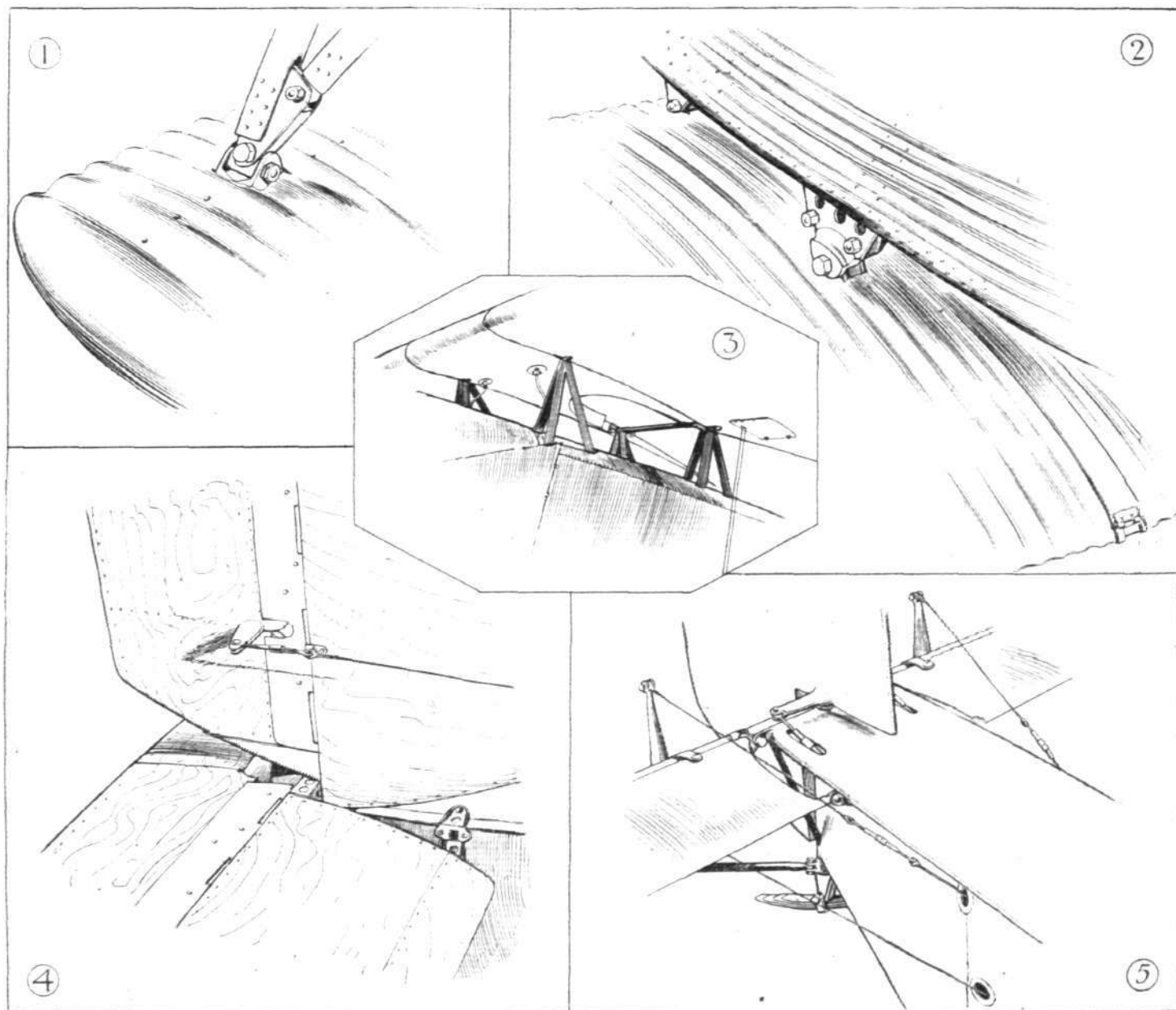
-AERO SHOW AT PRAGUE-

[In this, the final, instalment of our report on the Third International Aero Exhibition at Prague brief reference is made to such constructional features of German and French machines as seem worthy of notice. It should be pointed out that in most cases the machines exhibited were of types already well-known to readers of *FLIGHT*, this applying more particularly to the French machines, although also to a considerable extent to the German. If, therefore, the number of features illustrated is fairly small, the reason is that space does not allow of publishing sketches and photographs of features or constructional details which are already familiar to our readers. We have already devoted more space to the

Prague Aero Show than has any other aviation journal in the world, and we do not, therefore, think we need apologise for the relative shortness of this week's instalment.—Ed.]

THE GERMAN MACHINES

BUT three German aircraft firms were actually showing at Prague, the Albatroswerke, Dietrich-Gobiet Flugzeugwerk, and the Junkers Werke. Of the two Albatros machines exhibited the L.60 two-seater has already been described in detail, and the only addition that seems necessary is the manner in which the openings between fin and rudder and between elevator and tail plane are covered up so as to avoid



SOME GERMAN CONSTRUCTIONAL DETAILS AT PRAGUE : 1. The strut-attachment on the lower plane of the Junkers type "U." 2. Attachment of lower plane to fuselage on the same machine. 3. The parasol monoplane wing of the Dietrich-Gobiet is attached to the fuselage by four tubular tripods. 4. In the Albatros L.59/60 the slot between rudder and fin and between elevator and tail plane is covered with hinged aluminium strips. 5. The unusual termination of the top longerons in the Albatros L.66.

air losses through the cracks. The method is simple enough, and is shown in Fig. 4 of the accompanying set of sketches. The tail surfaces themselves are covered with three-ply, and the cracks are covered with aluminium strips hinged to the fixed surfaces. The trailing edges of the strips are kept in close contact with the movable control surfaces by light springs. The arrangement appears quite good, and is certainly simple. The second Albatros, the L.66 light 'plane two-seater, is chiefly remarkable for the fact that the fuselage is of welded steel tube construction. This is an innovation which is somewhat remarkable, as this firm has hitherto rather made a speciality of all-wood construction. The fuselage terminates at the rear in a somewhat unusual way, as shown in Fig. 5. The top longerons, instead of meeting in a point, have their rear ends a foot or so apart, and carry the tail plane, which is also of tubular construction. Otherwise the machine does not appear to call for further comment than that published in our issue of June 12, when two views of the machine were given.

Of the two Dietrich-Gobiet machines shown the biplane, type "D.P. IIa," is of straightforward construction, with welded steel tube fuselage and wood wings, much like the Fokker D.VII. The monoplane, the "D.P. VIIa," is of very similar construction, and the only unusual feature illustrated by a sketch is the tripod mounting of the wing. In place of the usual *cabane* the centre-section, which contains the petrol tank, is supported at each corner by a tripod of steel tubes, as shown in Fig. 3. Quick-release devices are incorporated in the apex of each tripod so as to facilitate dismantling the wing. The cut-out in the trailing edge is larger than usual, and extends, it will be seen, some distance ahead of the centre-section rear spar, which is at this point formed by a steel tube.

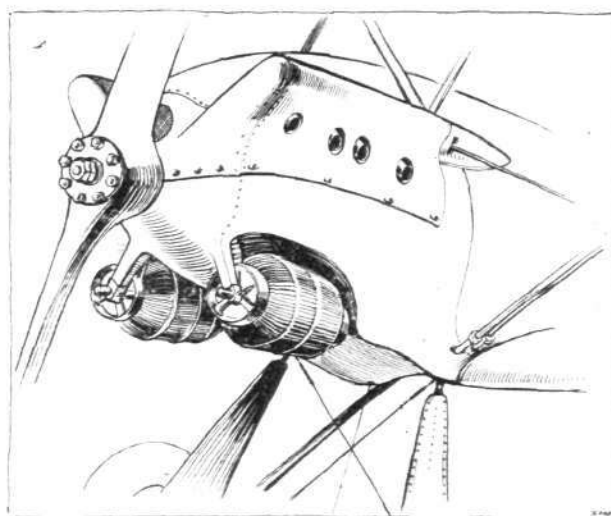
Of the three machines exhibited by Junkers two were of well-known type, and were illustrated on June 12. The third, the type "U," was a development of the "Penguin" exhibited at Gothenburg last year. The type "U" is a school or sports machine, and the main alteration from the original type "T" is the addition of a narrow-chord lower plane. The manner in which this lower plane is supported, at the tip by Vee struts and at the fuselage by special fittings, is illustrated in Figs. 1 and 2. It should be pointed out that in place of the Vee strut ordinary parallel double struts may be employed, fittings being provided on the lower plane for this purpose. The sketches showing the attachments are, we think, self-explanatory.

THE FRENCH MACHINES

THE French section at Prague was excellently managed, and a special catalogue, printed in French and Czech, was issued. In addition to the machines and engines shown, the French Under-Secretary for Air had a comprehensive selection of photographic views, tableaux, etc. One of the latter showed, by moving figures, the relative speeds of walking, cycling, motor-cycling, motoring, railway travel and flying. By way of giving an idea of the amount of flying done by French

civil aircraft, it was shown that the total distance covered by French commercial aeroplanes was equivalent to 241 times around the earth, or 26 journeys to the moon. The French certainly seem to know how to appeal to technicians and the general public alike, and it should be remembered that the French section was official; in fact, they themselves termed their section the "Official French Aero Show at Prague." As a piece of propaganda the show was excellent, and one from which our own Air Ministry and the S.B.A.C. might learn a good deal for future occasions.

As regards the machines themselves, these were without exception of old and well-known type. Probably the machine that attracted most attention was the Breguet XIX, on which Seguin and Dagneaux flew from Paris to Prague in 4 hours, 25 minutes. The wonderful performance, on a similar machine by Lieut. Pelletier d'Oisy in flying from Paris to Tokio



The Spad 81 C.1 has its two Lamblin radiators mounted in a somewhat unusual fashion, as shown in this sketch.

was no doubt largely responsible for the attention which this machine received. The details of the construction have already been described and illustrated in *FLIGHT*, both on the occasion when the first machine of the type was exhibited at Paris and on several occasions more recently.

The only other machine presenting any unusual features was the Spad 81 C.1. Photographs and a general description of this machine were published in our issue of June 12. The fuselage is of the streamline monocoque type, covered with strips of tulip wood. The two old-type Lamblin radiators were partly housed in the engine cowling, as shown in the accompanying sketch.



A CORNER OF THE BRITISH EXHIBIT AT PRAGUE: In the foreground the Armstrong-Whitworth "Siskin," with Siddeley "Jaguar" engine.

LIGHT 'PLANE AND GLIDER NOTES

ENTRIES for the "Tour de France" for light 'planes, to be held from July 24 to August 10, seem to be very slow in coming in. Up to the time of writing only two machines have been entered, both Dutch. These two are entered by the Vliegtuig-Industrie "Holland," which firm will be better remembered by readers of FLIGHT as the constructors of the Carley light monoplane described and illustrated in our issue of November 29, 1923. One of the machines entered, known as "Holland 2," is actually the Carley monoplane on which Raparlier flew from Rotterdam to Paris, and later, after demonstrating the machine at Le Bourget and Villacoublay, back to Rotterdam. The machine is fitted with a three-cylinder Anzani engine of 1,800 c.c. capacity. It is a single-seater cantilever monoplane with triangular section plywood-covered fuselage. The over-all dimensions are: Length, 15 ft. 9 ins.; span, 24 ft. 7 ins.; wing area, 109 sq. ft.; weight empty, 300 lbs.; weight fully loaded, 500 lbs.; power loading, 22 lbs./h.p.; wing loading, 3.9 lbs./sq. ft.

THE second Carley machine entered is a little biplane two-seater, with three-cylinder Anzani engine of 2,200 c.c. capacity. (It should be remembered that for the "Tour de France" the engine capacities allowed are 2,000 c.c. for single-seaters and 3,000 c.c. for two-seaters.) The Carley biplane has an overall length of 19 ft. and a wing span of 25 ft. 3 ins. The wing area is 151 sq. ft., and the weight empty 473 lbs. The total loaded weight is 850 lbs., giving a wing loading of 5.6 lbs./sq. ft. On actual speed tests in Holland this machine is stated to have developed a speed of just over 70 m.p.h., while the landing speed is reported to be but 22 m.p.h. Piloted by the Dutch pilot Van Opstal, the "Holland 3" reached an altitude of 6,900 ft. in 40 minutes.

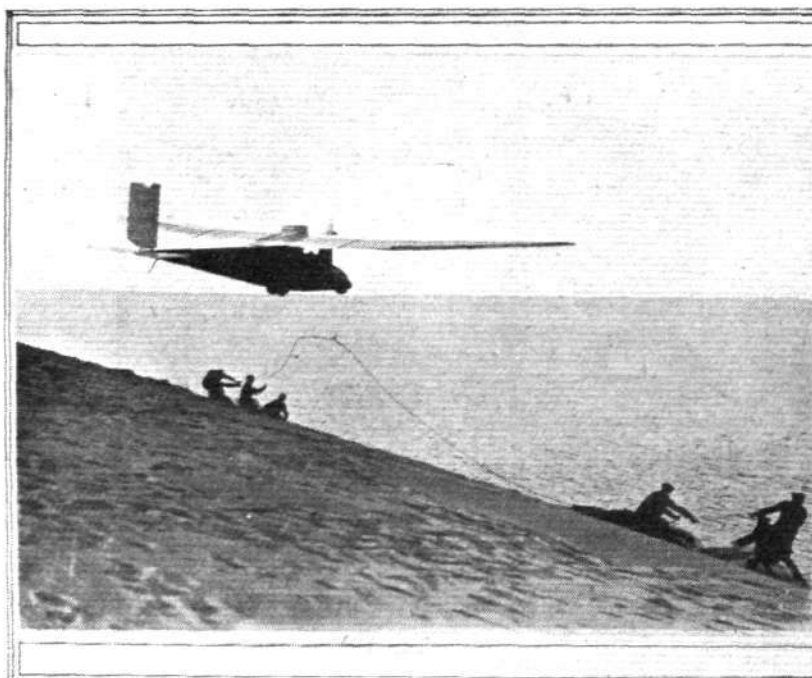
It has now been decided that Clermont Ferrand, the scene of the first French glider meeting, is to be the first stage in the "Tour de France." The town itself, the Aero Club d'Auvergne, and the Association Française Aérienne are offering prizes which amount to 21,000 francs for this first stage of the flight. It is expected that other cities over which the course will be laid will come forward and offer prizes for stages terminating there, so as to increase the already generous prizes offered by the "A.F.A." Up to date the total amount of prizes have reached the not inconsiderable sum of 80,000 francs, of which the "A.F.A." is offering 65,000 francs. There is little doubt that by the time other localities have been selected as turning points the total will reach 100,000 francs. Thus it is quite well worth while for British machines to take part, and although

the smaller engines with which last year's types were fitted are rather a handicap, many of the machines should be capable of putting up a very good show. It is, therefore, to be hoped that several will be entered for the "Tour de France." Full particulars may be obtained from the Association Française Aérienne, 40, Quai des Celestins, Paris, (4e). The entrance fee is 200 francs, and entries will be received up to the afternoon of June 30, 1924.

THE start from Paris will take place on Sunday, July 27, and flying will take place on alternate days only, i.e., Sunday, July 27; Tuesday, July 29; Thursday, July 31; Saturday, August 2; Monday, August 4; Wednesday, August 6; Friday, August 8; and Sunday, August 10. Eliminating trials will be held at one of the Paris aerodromes on July 24, 25, 26. The "Tour de France" is a speed race, the prizes for which are divided into two main groups—for greatest speed over individual stages, and for greatest aggregate speed over the whole course, which is of approximately 1,600 miles length.

THE second German glider meeting at Rossitten, near Königsberg, was held in the middle of May, and was chiefly remarkable for the fact that the world's duration record for gliders was beaten by the German school teacher Schulz, who succeeded, on May 11, in remaining up for 8 hours 42 minutes 9 seconds. A correspondent states that Schulz's greatest difficulty was that of keeping warm, as he had ascended without special clothing, and had not even got on a pair of gloves. From this it appears that he did not, when starting, contemplate any attempt on the world's record. As far as can be gathered, the machine used was last year's type, a somewhat crude affair built by Schulz himself and condemned at last year's Rhön meeting as being structurally weak. Nevertheless, the machine appears to have held together, and won Schulz the first prize and several other prizes. A new machine had been built by him for this year's competition, but it is believed that the one used in the record flight was the old model.

ANOTHER feature of the meeting was Martens' flying on the "Strolch." Although he did not come anywhere near equaling Schulz's performance, Arthur Martens made many excellent flights, and the opportunity was taken to ascertain, by scientific measurements, the characteristics of his machine. The rate of descent was ascertained to be 0.5-metre (1.64 ft.) per second, which is an extraordinarily good figure. The gliding angle of the "Strolch" was found to be 1 in 20, so that the efficiency of this machine appears to have been amply demonstrated.



FROM THE GERMAN GLIDER AND LIGHT 'PLANE EXPERIMENTS AT ROSSITTEN, NEAR KOENIGSBERG: On the left, Herr Arthur Martens being catapulted off on his machine "Max," and on the right a picture of Martens standing by the 4 h.p. engine of his machine.

On another glider, Mr. Martens made several flights. This machine, the "Max," was fitted with an Ilo engine of about 5 h.p., and as long as the wind gave a certain amount of assistance the machine could remain aloft. If, however, the wind dropped, the machine usually had to come down, the power developed by the engine being, apparently, insufficient for flight. In one of the accompanying photographs the "Max" is seen being catapulted off the top of a hill. We understand that Herr Martens intends to fit the machine with one of the Blackburne "Tomtit" engines, when a vastly improved performance is to be looked for.

PRESENT at the meeting was also Herr Budig, whose automatically-stabilised machine was illustrated in *FLIGHT* a year or more ago. Here again the engine was of insufficient

power, and it is believed that Herr Budig, like Herr Martens, intends to procure a Blackburne engine for his machine.

A LIGHT 'plane competition, held at about the same time, was won by Udet on one of his low-wing monoplanes. Second was another Udet monoplane piloted by Hailer, while third place fell to Zimmermann on a Junkers J. 16. It is, perhaps, scarcely correct to refer to this competition as being for light 'planes, as all the machines were fitted with engines of considerably greater capacity than the 1,100 or 1,500 c.c. generally regarded as marking the maximum in the light 'plane class in this country. Rather are the machines to be regarded as belonging to the sporting type represented in this country by the Avro "Baby" with 40 h.p. Green engine.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

RACING COMMITTEE

MEETINGS of the Racing Committee were held on Tuesday, May 27, and June 3, 1924, when there were present:—Air Vice-Marshal Sir W. S. Brancker, K.C.B., in the Chair, Group-Capt. F. W. Bowhill, C.M.G., D.S.O., R.A.F., Lieut.-Col. W. A. Bristow, Capt. R. J. Goodman Crouch, Lieut.-Col. M. O. Darby, Lord Edward Grosvenor, Lieut.-Col. F. K. McClean, A.F.C., Howard T. Wright, Lieut.-Col. A. Ogilvie, C.B.E., and the Secretary.

Racing Fund.—A donation of £500 to the Racing Fund from Sir Charles Wakefield, Bart., was reported.

It was decided to allocate prizes as follows:—

King's Cup Race.—£100 from Mr. Samuel Samuel, M.P.; £100 from Sir Charles Wakefield, Bart.

Aerial Derby.—First prize, £300 from Sir Charles Wakefield, Bart.; handicap, £100 from Mr. Samuel Samuel, M.P.

King's Cup Race.—The turning points were fixed as follows: Leith Harbour; The Castle, Dumbarton; Pendennis Castle, Falmouth.

It was decided to issue a complete list of emergency landing grounds in the neighbourhood of the course.

Aerial Derby.—The report of Lieut.-Col. F. K. McClean and the Secretary on the 50-mile course at Lympne was received, and it was decided to have the turning points at Hawkinge, Womenswold and Pluckley.

The charges for admission were fixed at 3s. and 1s. 3d.; motor-cars, 3s.

Two-Seater Light Aeroplane Competition.—Additional prizes were reported as follows:—

Society of Motor Manufacturers and Traders, £150.

British Cycle and Motor-Cycle Manufacturers and Traders Union, £150.

Grosvenor Challenge Cup.—The race for the Grosvenor Challenge Cup will be held at Lympne Aerodrome, Hythe, on the last day of the Two-Seater Light Aeroplane Competitions in September next.

Lord Edward Grosvenor, having intimated to the Committee that he would prefer the race this year being confined to light aeroplanes with engines not exceeding 1,100 c.c., this was agreed to.

Gordon Bennett Balloon Race.—The following were selected to represent Great Britain in the Gordon Bennett Balloon Race at Brussels on June 15:—

"Banshee III" (owner, Mrs. John Dunville). Pilot, Squadron-Leader F. A. Baldwin; Assistant, Lord Edward Grosvenor.

"Margaret" (owner, Mr. E. Allen). Pilot, Capt. C. W. Spencer; Assistant, Capt. C. W. Berry.

Handicappers.—The handicappers for the year were appointed as follows: Lieut.-Col. W. A. Bristow, Capt. R. J. Goodman Crouch.

TECHNICAL COMMITTEE

A MEETING of the Technical Committee was held at the Royal Aero Club on Thursday, June 12, 1924, at 4 o'clock, when there were present: Lieut.-Col. M. O'Gorman, C.B., in the Chair; Lieut.-Col. C. B. Heald, C.B.E., Major R. H. Mayo, Lieut.-Col. H. W. S. Outram, and the Secretary.

Mr. W. O. Manning was elected to the Technical Committee. The Committee considered the following questions which will be discussed at the Conference of the F.A.I. to be held in Paris on June 24-28.

- (1) Method of calculating the volume of balloons.
- (2) Registration of balloons.
- (3) Modifications in the requirements for certificates of airworthiness for free balloons.
- (4) Calibration of barographs used in height records.
- (5) Apparatus for recording minimum temperature at top of flight.
- (6) Medical examination for private pilots' licences.
- (7) Revictualling during speed records.

COMMITTEE MEETING

A MEETING of the Committee was held on Wednesday, June 18, 1924, when there were present: Brig.-Gen. Sir Cape, Holden, K.C.B., F.R.S., in the Chair; Mr. Ernest C. Bucknall, Lieut.-Col. John D. Dunville, C.B.E., Col. F. Lindsay Lloyd, C.M.G., C.B.E., Lieut.-Col. F. K. McClean, A.F.C., Lieut.-Col. M. O'Gorman, C.B., Mr. F. Handley Page, Rear-Admiral Sir Godfrey Paine, K.C.B., M.V.O., and the Secretary.

Election of Members.—The following new Members were elected:—

Flying Officer Edward Langley Wilson Hill Alms, R.A.F.
Capt. Hubert Stanford Broad.
Squadron Leader James Everidge, R.A.F.
Pilot Officer Hubert Williams Frith, (R.A.F. Reserve).
Flying Officer Edgar Fulford, R.A.F.
Frederick Laurence Heath.
Frederic William Hobdey.
Flying Officer Charles Gambier Jenyns, R.A.F.
Flying Officer Owen John Frederick Jones-Lloyd, R.A.F.
Frank Collett McDonald.
Flying Officer John Barker Hereward Rogers, R.A.F.
Flight Lieut. William Sutherland, R.A.F.
Flight Lieut. Frederick Thomasson, R.A.F.

Racing Committee.—The Report of the Racing Committee on the following items was received and adopted: Racing Fund, Allocation of Prizes; King's Cup, Regulations; Aerial Derby, Selection of Course; Two-Seater Light Aeroplane Competition, Additional Prizes; Grosvenor Cup, Size of Engine; Appointment of Handicappers.

Technical Committee.—The report of the Technical Committee on the various questions to be raised at the F.A.I. Conference was received and adopted.

Lieut.-Col. M. O'Gorman and Air Vice-Marshal Sir W. S. Brancker were appointed delegates to represent the Royal Aero Club at the Conference of the F.A.I. to be held in Paris on June 24-28.

Britannia Challenge Trophy.—It was decided to insert a notice in the technical papers asking for suggestions as to the most meritorious performance in the air during 1923.

Aviator's Certificate.—The following aviator's certificate was granted:—

7959, Maurice Charles Heaton Lamplough, June 6, 1924.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W.1.
H. E. PERRIN, Secretary

FUEL ECONOMY IN FLIGHT

By Lieut.-Col. H. T. TIZARD

As briefly announced in FLIGHT recently, this year's Wilbur Wright Lecture was delivered before the Royal Aeronautical Society by Lieut.-Col. H. T. Tizard, A.F.C., on May 29, and was entitled "Fuel Economy in Flight." The lecturer commenced by pointing out that fuel consumption was the ultimate measure of the overall efficiency of the complete aeroplane, the pilot, and the organisation. In spite of improvements in fuel consumption since the War, the weight of fuel carried in a commercial aeroplane on the London-Paris service, cruising at about 100 m.p.h., was still approximately half the full paying load, so that a reduction of the fuel load by 40 per cent. would increase the paying load by 20 per cent. Fuel economy was thus a matter of first importance, and was not to be measured only by a saving in the fuel bill. The lecturer made the very neat point that fuel cost would be of small importance if the possible savings on the fuel bill were only a small proportion of the profits, but a very different thing when, as is now the case, the savings were a large proportion of the losses.

Col. Tizard then elaborated the principles governing the most economical use of an aeroplane in flight, having regard to weather conditions, and arrived at the conclusion that for all practical purposes it could be assumed that: *the range of any given aeroplane in still air depended only on the indicated air speed, and was independent of height.* The variation of engine power with height affected the performance of an aeroplane, but not its range at any indicated air speed. These conclusions applied to flying in still air only. In practice it was usually found that wind increased with height, and it was then a good average rule to fly high with a following wind and low when flying against the wind.

By taking average figures from a number of different types of aeroplanes, the lecturer arrived at the following approximate figure: Fuel consumption in lbs./mile = $0.00025W$, where W is the total loaded weight of the aeroplane. Taking petrol as weighing 7.2 lbs./gallon, the number of air-miles travelled per gallon would be $29,000/W$. In modern aeroplanes the figure for miles per gallon might be taken as $30,000/W$. This figure, incidentally, was quoted by the lecturer as having been given by Prof. Bairstow as representing the fuel consumption of a modern light aeroplane. [Naturally we do not know upon which machine this estimate was based, but it will be remembered that at the last year's Lympne meeting the "Wren" and A.N.E.C. monoplanes covered 87.5 miles per gallon, over a triangular course, flying in a strong wind. As the "Wren" weighed 420 lbs. loaded, the mileage per gallon on the $30,000/W$ basis should only have been 71.4, or, in other words, in the case of the "Wren" the formula becomes $36,750/W$. The A.N.E.C. monoplane weighed 470 lbs., and the formula for this machine would, therefore, become $41,200/W$. These flights were, however, made for the express purpose of covering the greatest possible distance, every other consideration having been sacrificed for the time being, special jets being fitted and special propellers which kept the revolutions down. It seems probable that under ordinary practical conditions the formula given may be somewhere very near the actual truth for the majority of machines. The lecturer stated that in the case of the "D.H.34" commercial aeroplane a detailed analysis by Mr. Cowley showed that this machine almost exactly tallied with the formula given.—Ed.]

The lecturer pointed out that, other things being equal, if the wing area of the machine be decreased the maximum drag with speed would be smaller, so that at high speeds the range would be greater than that of the more lightly loaded machine. Col. Tizard admitted that the effect of wind on actual range was so great that, although calculations of the maximum range in still air had a certain interest, it might be said that this interest was largely academic.

Turning to the question of economical speed, the lecturer called attention to the fact that the lower the speed of an aeroplane the less fuel would it consume in travelling a given distance through the air; but also said it was equally obvious that air transport was of no advantage unless it could compete favourably in speed with other forms of transport against the highest probable wind that would be encountered. Conditions varied in different parts of the world, but near home, he said, it was reasonable to assume that the speed over the ground in adverse weather conditions should be at least that of an express train. That brought him to the assumption that the cruising speed should be 60 m.p.h. greater than the highest wind likely to be encountered. From tables and

charts taken over a number of years the lecturer deduced an average wind velocity at 1,500 to 2,000 ft. of under 40 m.p.h. on 87 per cent. days of the year. Accepting the average figure of 40 m.p.h., the air speed of a commercial aeroplane should then be at least 100 m.p.h., which was, he said, the accepted figure today. Careful examination of meteorological reports indicated that this figure was a reasonable one for the London-Paris route, but Col. Tizard pointed out that the case would be very different if a regular flight in an easterly or north-easterly direction was contemplated. It would then be necessary to provide for winds of a velocity of 50 m.p.h. in order to ensure a regular service in winter, and the highest economical speed would have to be 110 m.p.h. instead of 100.

Having decided that the highest cruising speed should be 100 m.p.h., it was important to provide that the drag of the aeroplane should be as low as possible. The minimum drag of the wings occurred at a speed of about 1.7 times the landing speed, and if one wanted to secure minimum drag of the whole aeroplane at 100 m.p.h., the landing speed should be 59 m.p.h. which corresponded to a wing loading of 9.6 lbs. per sq. ft. This figure for wing loading applied to the middle of the flight, not to the beginning, and taking the amount of fuel used as 10 per cent. of the weight of the machine, the loading at the beginning of the flight should be 10 lbs. per sq. ft. This, therefore, appeared to be the correct figure for design of a fully loaded aeroplane for most economical flight at 100 m.p.h. The longer the distance to be travelled and the higher the wind, the higher must be the loading for most economical results.

Col. Tizard then referred to other arguments to be considered, and pointed out that machines were in use having both greater and smaller wing loading than the above figure, and that there were advocates of high loading and advocates of low loading. Taking into consideration the claims advanced on both sides, he thought that on the whole the advantage of the argument was with the advocates of high loading, especially if no account was taken of the difficulty of high landing speed. He came to the conclusion that it was natural to suggest that a loading of 10 lbs. per sq. ft. was not only aerodynamically the most efficient, but also from a practical point of view the best compromise.

The lecturer next turned to the question of the directions in which we might look for marked improvements in the near future. He did not think that airscrew efficiency was likely to be substantially increased. A reduction in drag might be effected in two ways: by the introduction of wings of higher efficiency and by substantial improvements in "body" design. With regard to the former there was a possibility that an increase in the maximum L/D ratio could be obtained by a sacrifice of the lift at high angles of incidence, i.e. by increase in landing speed for wings of the same area, and he thought the latter disadvantage might be overcome by the adoption of one of the devices now under experiment for securing low landing speed by altering the shape of the wing at high angles of incidence. Coming to the second item, i.e. body drag, it had long been realised that there were certain methods by which great improvements could be effected if the purely engineering difficulties could be overcome. Some method of withdrawing the undercarriage into the main body during flight was badly wanted. The substitution of wing radiators for the nose radiators had already been accomplished successfully. Apart from these questions, knowledge of the best shape of fuselage was, he said, still very incomplete. If he might quote a recent remark of Professor Bairstow, no scientific data existed on the best length for a body of a given maximum cross-section. Experimental work in that direction might lead to results of great importance. He hardly thought it unduly optimistic to look forward in the near future to a reduction in body drag of a commercial aeroplane to as low a figure as $0.04 W$ at 100 m.p.h. This would be a 40 per cent. reduction in body drag on the figure taken to represent the present average, and would correspond to a 24 per cent. reduction in the total drag at 100 m.p.h. if there were no improvement in wing efficiency. At higher speeds the reduction would be still greater.

Col. Tizard pointed out that when such improvements were effected we should be faced with an interesting problem, and as this may not perhaps be generally realised, we quote this paragraph in full.

"At present," the lecturer said, "an aeroplane whose engine operates at under 85 per cent. torque and 90 per cent. speed at a level air-speed of 100 m.p.h. has just sufficient

reserve power to provide for a reasonable rate of climb at ground level even if the airscrew is designed to give maximum efficiency at the cruising speed. But if the body drag is reduced by 40 per cent., this will no longer be true; and either the power of the engine will have to be sufficient to give a much higher maximum speed, or some other means will have to be adopted to improve the rate of climb—e.g., by a variable wing, or by sacrificing airscrew efficiency at cruising speed, or by the use of a fuel such as alcohol, which gives a higher torque than petrol for climbing purposes. It will be wise to prepare for these eventualities beforehand. The object of pointing them out now is to show that it cannot necessarily be assumed that a substantial decrease in body drag will also mean a corresponding decrease in engine power and weight."

On the question of improvements in engines, the lecturer stated that developments were now approaching a stage of great importance. The multi-cylinder engine suffered under two disadvantages—(a) that, owing to imperfect distribution, some cylinders were being supplied with a richer mixture than others, and (b) that it was impossible to explode completely in the short time available a mixture containing more than a 15 per cent. excess of air. If it were possible to explode a petrol-air mixture in the presence of excess of air, an improvement would be effected. More than that, the thermal efficiency would increase as the torque diminished, if the reduction in torque was effected simply by reducing the petrol supply and keeping the air supply constant. The necessity for altitude controls to obtain the highest economy would also disappear. Col. Tizard stated that only two practical methods

of securing these advantages had been suggested. One was the method of direct injection, but although experiments had yielded very interesting results, he was of the opinion that it was still very doubtful whether engines of this type would be found suitable for heavier-than-air machines. The other method was that of stratification. This method had been pursued by Mr. Ricardo with a persistence worthy of success, and Mr. Ricardo had evolved a method which appeared to be both simple and effective. Without going into details, Col. Tizard quoted certain results obtained in this manner. Thus preliminary experiments had indicated that with compression ratios of 5:1 a rate of consumption of 0.45 lb. per b.h.p. hour could be obtained. There was, he thought, no reason to doubt that equally good results could be obtained with multi-cylinder engines of a size suitable for commercial aeroplanes.

Summing up, the lecturer stated that it was in the directions of lowering body resistance and of developing engines of greater economy in fuel consumption that there appeared to be the most immediate possibilities of a marked improvement in the economy of flight. He thought we might look forward without undue optimism to commercial aircraft which had 25 per cent. less resistance at 100 m.p.h. than those at present in existence, and which were fitted with engines of 20 per cent. higher thermal efficiency at cruising speeds. The net effect would be that the range with a given amount of fuel would be nearly doubled, or that for a short range of 250 miles against a head wind of 40 m.p.h. the commercial load could be increased by over 20 per cent. and the cost of fuel reduced by over 40 per cent.

PROGRESS IN THE BIG FLIGHTS

ROUND-THE-WORLD FLIGHTS

ONCE again we have to report that but little progress has been made by the World-flyers during the past week. Squadron-Leader MacLaren's new Vickers "Vulture" amphibian flying boat was all ready for flying on Saturday last, but owing to unceasing torrential rains at Akyab during the week-end the British crew have been unable even to make test flights, let alone resume their journey.

The American team, under the leadership of Lieut. Smith, also had their journey interrupted by a slight mishap. On Wednesday, June 18, they all arrived safely at Bangkok. They reached Rangoon on June 20, having stopped between Bangkok and Rangoon at Tavoy. During the latter part of their journey they encountered very squally weather, and two of the Douglas World Cruisers alighted on the Rangoon River at Monkey Point shortly after 5 p.m., the third machine arriving about half an hour later. They were received by the United States Consul, Col. Ross (Commander, Rangoon Brigade Area), and the Commissioner of Rangoon, who represented the Governor of Burma. The American team had hoped to resume their journey on June 22, but the night previous a cargo boat collided with one of the machines and damaged the wings. Furthermore, Lieut. Smith was indis-

posed, so it was necessary to postpone the departure for Calcutta for a few days.

Lisbon-Macao Flight

HAVING, practically speaking, reached their journey's end, the Portuguese military airmen, Majors Brito Paia and Sarmiento Beires, have unfortunately met with another mishap, and have been forced to abandon the flight from Lisbon to Macao. On June 20 they left Hanoi on their D.H.9 at 9.30, to complete the last 500 odd miles of their journey to Macao. As they approached Macao shortly after noon they encountered very bad weather, and decided it was impracticable to land at Macao. They made for Canton, but engine trouble developed, and they were compelled to make a forced landing at Sham-Chun, on the outskirts of Hong-Kong. Unfortunately, they crashed on landing, smashing the machine and receiving slight injuries, and have in consequence abandoned any further attempt to reach Macao by air, but have proceeded to this place by train. However, to all intents and purposes, they have achieved their object, for as a matter of fact they have really flown beyond Macao, and would have actually landed there but for the unfavourable conditions prevailing at the time of their arrival. Thus ends the second of the big World-Flights, in which 8,600 miles have been covered in 80 days.

The Gordon Bennett Balloon Race.

FOR the third time in succession Lieut. de Muyter, the Belgian balloonist, has won the Gordon Bennett Balloon Race, and thus wins the Cup outright. Lieut. de Muyter and his companion, M. Léon Coeckelbergh, after leaving Brussels, travelled in the "Belgica" towards Reims, when a change of wind took them over Paris, thence over the Channel to Brighton. They then proceeded up across the centre of England as far as Carlisle (*via* Birmingham) until another change of current carried them to the North-East coast. Near the Firth of Forth dense fog was encountered, and they decided to make a landing, which was successfully accomplished in a field near St. Abb's Head, Berwick.

Below we give a provisional classification of the competitors' positions, etc.:

| Competitor and Balloon. | Country. | Landing. | Distance. |
|------------------------------|----------|-----------|-----------|
| | | | Kms. |
| De Muyter, "Belgica" | B. | St. Abb's | 750 |
| Laporte, "Ville de Bordeaux" | Fr. | Brighton | 395 |
| Honeywell, "Uncle Sam" | U.S. | Rouen | 320 |
| Valli, "Ciampino V" | It. | Fécamp | 300 |
| Girassi, "Aérostiére III" | It. | Méret | 290 |

| | | | |
|---------------------------------|---------|--------------------|--------|
| Casas, "Hespéro" | .. Sp. | St. Remy-l'C. | .. 280 |
| Allen, "Margaret" | .. G.B. | Dieppe | .. 270 |
| Armbruster, "Helvetia" | Sw. | St. Martin du Bosc | .. 230 |
| Labrousse, "Ville de Bruxelles" | B. | St. Gengolp | .. 220 |
| Baldwin, "Banshee III" | G.B. | Aubané | .. 210 |
| Balbas, "Capt. Penaranda" | Sp. | Gamaches | .. 205 |
| Bienaimé, "Picardie" | .. Fr. | Brey | .. 200 |
| Van Orman, "Goodyear III" | .. U.S. | Amsterdam | .. 180 |
| Cormier, "Anjou IV" | .. Fr. | Herly-Arlésienne | .. 175 |
| La Llave, "Fernandez-Duro" | Sp. | Lottingham | .. 160 |
| Veenstra, "Prince-Leopold" | B. | Leffinghe | .. 125 |
| Peek, "U.S. 14" | .. U.S. | Malmedy | .. 120 |

B = Belgium. Fr. = France. G.B. = Great Britain. It. = Italy. Sp. = Spain. Sw. = Switzerland. U.S. = United States of America.

A Danish Machine for Japan.

THE Rohnbach-Metal-Aeroplane Co., of Copenhagen, is building a 12-seater machine for the Japanese Government.

PERMANENT COMMISSIONS IN THE R.A.F.

New Examination for Entry into Cranwell Cadet College

THE Air Ministry announces that a new scheme of examination for entry into the R.A.F. Cadet College at Cranwell, Lincs., with a view to obtaining permanent commissions in the Force has been approved by the Air Ministry and will come into force next year. The scheme differs from the old scheme in that it is specifically designed to allow boys of suitable character and ability, whether educated on the classical, science or modern sides of public and secondary schools, to enter the Cadet College without special tuition. The subjects of the examination will, therefore, be those taught in the higher forms of schools, and a wide choice of subjects will be given to candidates. The examination will also include an interview which will carry marks and will test the suitability of candidates in respect of intellectual outlook and general character to hold commissions in the Royal Air Force. Before admission to the examination boys educated in England will be required to produce School Certificate A or B, obtained by passing the Oxford and Cambridge School Certificate examination, the Oxford Senior Local examination, the Cambridge Senior Local examination, or certain other examinations. Boys educated in Scotland may produce a certificate from the Scottish Education Department that they have attained a standard equal to that of those examinations, and boys educated in Northern Ireland a similar certificate from the Ministry of Education of Northern Ireland. The Air Ministry hope that this new and more elastic scheme of examination will throw the Royal Air Force open as a permanent career for boys attending public and secondary schools far more widely than has hitherto been the case.

The age limits for the examination will remain as at present, namely, 17½ to 19 years.

The scheme of examination will be as follows:—Candidates will be required to take in Part I of the examination, English, General Knowledge, Interview and Record, and one of the following: Modern Language, General History, Elementary Mathematics, Everyday Science. In Part II not more than three of the following subjects may be taken, namely, Latin, Greek, French, German, Modern History, Lower Mathematics, Higher Mathematics, Physics, Chemistry, Biology. Candidates taking French or German in Part II may not take a modern language in Part I; those taking Physics, Chemistry, or Biology may not take Everyday Science; those taking Lower or Higher Mathematics may not take Elementary Mathematics; those taking Modern History may not take General History. Candidates must obtain a minimum mark in Interview and Record and a sufficient aggregate on the whole examination to satisfy the Civil Service Commissioners.

As heretofore, candidates sitting for the R.A.F. Cadet College will be able to sit at the same time for the Army Cadet Colleges, Woolwich and Sandhurst, provided they are within the age limits laid down by the War Office and take the subjects required for entry into those colleges.

The examinations held in June and November of this year for entry into Cranwell will be under the old regulations contained in Air Publication 121, obtainable from H.M. Stationery Office or any bookseller for a shilling. The first examination under the new regulations will be held in June, 1925, and full details of the new syllabus are obtainable on application to the Secretary, Civil Service Commission, W. 1. An addendum to Air Publication 121, showing fully the new scheme will also be placed on sale by the Stationery Office at an early date.

The detailed regulations as regards the qualifying examination are as follows:—

Before admission to an examination under the revised scheme, a candidate other than candidates nominated by the Air Council on the recommendation of the headmaster of an approved school, must produce School Certificate A or School Certificate B, obtained by passing one of the following examinations:—

- The School Certificate Examination of the Oxford and Cambridge Schools Examination Board.
- The Senior Local Examination of the Oxford Delegacy for Local Examinations.
- The Senior Local Examination of the Cambridge Local Examinations and Lectures Syndicate.
- The School Certificate Examination of the University of Bristol.
- The School Certificate Examination of the University of Durham.

The General School Examination of the University of London.

The School Certificate Examination of the Northern Universities Joint Matriculation Board.

The Senior Certificate Examination of the Central Welsh Board.

A candidate educated in Scotland or Northern Ireland may, in place of School Certificate A or B, produce a certificate from the Scottish Education Department or the Ministry of Education for Northern Ireland showing that he has attained a standard equivalent to that of the School Certificate of the Oxford and Cambridge Schools Examination Board; provided also that for the examination of June, 1925, only, a candidate who may have competed unsuccessfully at an Army and Air Force Entrance Examination under the present regulations may be allowed to attend the examination under the revised scheme without being required to produce a School Certificate.

The full details of the scheme of examination are as follows:—

Part I.—(1) English, 100 (maximum mark); (2) General knowledge, 100; (3) Interview and record, 400; (4) One of the following:—Modern language, general history, elementary mathematics, everyday science, 100;

Part II.—Maximum marks, 300 each subject: (5) Latin; (6) Greek; (7) French; (8) German; (9) Modern History; (10) Lower Mathematics; (11) Higher Mathematics; (12) Physics; (13) Chemistry; (14) Biology.

A candidate for the Royal Air Force Cadet College, Cranwell, may not offer more than three subjects in Part II; except as provided in the next paragraph, any three of the subjects named may be offered.

No candidate may offer similar subjects in Parts I and II. That is to say, a candidate taking any modern language in Part II may not offer a modern language in Part I; a candidate taking Physics or Chemistry or Biology may not offer Everyday Science; a candidate taking Lower or Higher Mathematics may not offer Elementary Mathematics; and a candidate taking Modern History may not offer General History.

Modern Language (Subject 4).—Any one of the following modern languages may be offered:—French, German, Italian, Spanish, Russian, Arabic, Urdu.

Physics, Chemistry, Biology (12, 13, 14).—Not more than two of these may be taken; to be allowed to take any of these three subjects a candidate must satisfy the Civil Service Commissioners that he has had suitable laboratory training.

In addition to the above-named subjects, a candidate may take up freehand drawing, which carries 50 marks.

A candidate who has qualified for War Office Certificate "A" in the Senior or Junior Division of the Officers Training Corps, or in a Secondary School Cadet Unit, or in a recognised Territorial Cadet Unit, will be credited with 12 per cent. of the actual marks obtained at the Certificate Examination; thus, the Certificate marks ranging from 300 to 600, the marks credited will range from 36 to 72.

A candidate must obtain 140 marks in Interview and Record, and such an aggregate of marks in the whole Examination as to satisfy the Civil Service Commissioners.

The old scheme of examination is as follows:—

CLASS 1: Obligatory (2,000 marks each subject).—(1) English; (2) English History and Geography; (3) Mathematics A (elementary); (4) One of the following modern languages, French, German, Spanish, Russian, Italian, Arabic, Hindustani.

CLASS 2: Optional (three subjects may be taken—2,000 marks each subject).—(1) Latin; (2) Greek; (3) One of the seven languages mentioned above other than that taken as obligatory; (4) Mathematics B (intermediate); (5) Mathematics C (Higher); (6) either General Science or Physics and Chemistry.

Thus under the old scheme candidates had to take a number of different subjects of Class 1 in addition to the subjects of their choice in Part 2, and the Class 1 subjects carried more than half the total marks in the examination. Under the new scheme, candidates will only take one subject in Part I needing special study, and Part II, in which candidates have

a wide choice, will carry three times as many marks as the written papers in Part I. Under the old scheme it was necessary for boys (contrary to the normal practice in public schools) to continue studying an unduly wide range of subjects up to the age of taking the examination, say 18. To meet this situation many schools formed an "Army side" into which boys intending to go into the Army or R.A.F. were put at the age of about 15, and were thus to a large extent cut off from the normal work and normal competition of the school. It is felt that this state of things was not in the best interests of the education of Army and R.A.F. candidates, and under it boys who did not decide early to enter the Services, and did not, therefore, go into the "Army side," were at a great disadvantage in competing at the entrance examination. Moreover, boys attending schools which did not include an "Army side" had no opportunity

of preparation for the entrance examination unless their parents went to the expense of getting them special coaching outside.

The new scheme will make special preparation in the "Army side" or removal for outside coaching unnecessary, and will open the examination to boys from many schools which have not regularly contributed officers to the fighting Services in the past. It thus completes the process of democratisation begun five years ago by the improvement in the pay of the Services, and throws open permanent careers as officers of the R.A.F. to all boys who have received a good education in public and secondary schools. It is hoped that it will result in a large increase in the number of candidates coming forward and in these candidates having received a better education than was possible when special preparation was necessary for the entrance examination.

THE ROYAL AIR FORCE

London Gazette, June 10, 1924

General Duties Branch

The follg. Flying Offrs. are granted honorary rank of Flight-Lieut. (May 1):—R. Kennedy; H. T. Herring.

Observer Offr. A. C. Walker is transferred to the Res., Class B; June 8. The short service commn. of Pilot Offr. on probation R. D. Lawson is terminated on cessation of duty; June 11. Observer Offr. J. H. Gray relinquishes his short service commn. on account of ill-health, and is permitted to retain his rank; June 11.

Medical Branch

The follg. are granted short service commns. as Flying Offrs., with effect from and with seny. of the dates indicated:—A. Dickson, M.B.; May 19. A. A. Townsend, M.B.; May 27.

Reserve of Air Force Officers

The follg. are granted commns. on probation in General Duties Branch in ranks stated (June 10):—

Class A.—Flying Offr.—C. S. Emery. Pilot Offrs.—R. K. Harvey, H. E. London, C. C. Thurrell.

Class B.—Pilot Offr.—J. H. C. Harrold.

Flight-Lieut. A. R. T. Pison, D.S.C., is transferred from Class C to Class A; June 10. Flying Offr. on probation A. Dickson, M.B., resigns his commn.; May 19.

Memorandum

The permission granted to Lieut. W. J. Bunting to retain rank is withdrawn on his conviction by the civil power; May 8.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified:—

General Duties Branch

Group Captain A. L. Godman, C.M.G., D.S.O., to Sch. of Tech. Training (Men), Manston, to command; 2.7.24.

Squadron Leader: E. D. Atkinson, D.F.C., A.F.C., to No. 1 Sqdn., Iraq; 25.5.24.

Flight Lieutenants: C. E. V. Porter and G. I. Thomson, D.F.C., to No. 1 Flying Training Sch., Netheravon. 9.6.24. E. R. B. Playford to H.Q., India. 19.3.24. D. V. Carnegie, A.F.C., to Marine Aircraft Experimental Estab., Felixtowe. 12.6.24. J. A. Slater, M.C., D.F.C., to No. 1 Sqdn., Iraq. 26.5.24. F. St. J. Woolard, A.F.C., to remain at H.Q., Palestine, instead of to No. 216 Sqdn. as previously notified. R. A. George, M.C., to R.A.F. Depot, on transfer to Home Estab. 24.5.24. W. C. Day, M.C., to No. 84 Sqdn., Iraq. 14.5.24. E. W. Broadberry, M.C., to No. 4 Flying Training Sch., Egypt. 1.7.24.

Flight Lieutenants.—H. W. Woollett, D.S.O., M.C., to No. 208 Sqdn., Egypt; 5.6.24. A. F. Quinlan, to No. 13 Sqdn., Andover; 27.6.24. F. L. B. Helbert, to R.A.F. Depot, on transfer to Home Estab.; 24.5.24. D. H. Dabbs, to R.A.F. Depot (Non-effective Pool); 6.6.24.

Flying Officers: S. T. B. Cripps, D.F.C., to No. 17 Sqdn., Hawkinge. 9.6.24. C. D. Spiers and F. R. D. Swain, to No. 11 Sqdn., Netheravon. 9.6.24. D. D. A. A. Greig, D.F.C., and A. F. Scroggs, to Central Flying Sch., Upavon. 9.6.24. A. C. Lamb, to No. 3 Sqdn., Upavon. 9.6.24. H. Butlin to No. 111 Sqdn., Duxford. 9.6.24. A. E. Golds and E. B. Forster, to No. 24 Sqdn., Kenley. 9.6.24. E. Marler, to No. 1 Flying Training Sch., Netheravon. 9.6.24. O. B. Swain, to No. 99 Sqdn., Birmham Newton. 9.6.24. R. V. M. Odibert, to No. 58 Sqdn., Worthy Down. 9.6.24. D. H. Carey, to Armament and Gunnery Sch., Eastchurch. 16.6.24. O. K. Stirling Webb and E. V. Major, to No. 99 Sqdn., Birmham Newton. 11.6.24. L. H. W. Axtell, to R.A.F. Depot. 11.6.24. B. W. Duley, M.M., to No. 111 Sqdn., Duxford. 11.6.24. W. B. O. Fox, to No. 11 Sqdn., Netheravon. 11.6.24. H. A. Mullaly, to No. 41 Sqdn., Northolt. 11.6.24. F. L. Wolledge, to No. 12 Sqdn., Andover. 11.6.24. A. W. Bates, C. W. Croxford, D.S.C., and R. S. T. Fleming, to R.A.F. Base, Leuchars. 14.7.24. H. M. Burrows, to No. 19 Sqdn., Duxford. 14.7.24. G. A. Cavis-Brown, to R.A.F. Base, Gosport. 14.7.24. K. C. Garvie, to No. 29 Sqdn., Duxford. 14.7.24. E. N. D. Worsley, to R.A.F. Depot, on transfer to Home Estab. 26.5.24. F. H. Bedford, M.C., M.M., to Basrah Group H.Q. 1.6.24. G. Anderson, to No. 15 Sqdn., Martlesham Heath. 14.7.24. J. C. E. A. Johnson, to No. 24 Sqdn., Kenley. 14.7.24. P. I. V. Rippon, to No. 58 Sqdn., Worthy Down. 14.7.24.

Flying Officers.—F. G. A. Robinson and M. K. McGregor, to School of Photography, S. Farnborough; 3.6.24. M. W. Nolan, to Record Office, Ruiship; 16.6.24. R. A. Whyte, to R.A.F. Depot; 10.6.24. A. C. Heaven, M.C., to No. 13 Sqdn., Andover; 6.6.24. J. W. Turion Jones, to R.A.F. Base, Leuchars; 2.6.24. H. L. Beatty, to H.M.S. Argus; 6.5.24. J. W. C. Harcourt-Vernon, to No. 13 Sqdn., Andover; 2.6.24. E. L. W. H. Aims, to No. 13 Sqdn., Andover; 5.6.24; M. J. DuCray, to Armament and Gunnery

Sch., Eastchurch; 16.6.24. E. A. Hodgson, to Aden Flight; 3.6.24. E. C. Roark, to No. 55 Sqdn., Iraq; 21.5.24. G. C. B. Bernard-Smith, to No. 13 Sqdn., Andover; 23.6.24. G. Rose, to No. 7 Sqdn., Birmham Newton; 14.6.24. C. V. Lock and S. Wallingford, to R.A.F. Depot, on appointment to Short Service Commn.; 19.6.24.

Pilot Officers: J. A. Bramley, M. M. Miln and C. G. C. Sullivan, to No. 58 Sqdn., Worthy Down. 11.6.24. J. H. Caulfield, C. F. Caunter, C. H. A. Denny, and P. Stainer, to No. 111 Sqdn., Duxford. 11.6.24. E. R. H. Coombes, T. A. Hale-Munro, A. C. Mason, and H. St. George-Taylor, to No. 41 Sqdn., Northolt. 11.6.24. D. J. Dorey, W. J. Pearson, P. Slocumbe, C. U. Tristram, and A. R. Buchanan, to No. 12 Sqdn., Andover. 11.6.24. H. St. E. Dracott, C. V. Fevez, G. D. Hamilton, I. B. Pigott, and J. A. Wall, to No. 11 Sqdn., Netheravon. 11.6.24. J. C. Hill, V. A. C. Ross, and E. V. H. Jarvis, to No. 17 Sqdn., Hawkinge. 11.6.24. St. J. F. Wintour, to No. 99 Sqdn., Birmham Newton. 11.6.24. L. M. T. Marescaux, to No. 24 Sqdn., Kenley. 11.6.24. B. W. Hemsley, to R.A.F. Depot. 11.6.24. I. B. Gray, H. C. Evans, and E. A. C. Bushell, to No. 9 Sqdn., Manston. 11.6.24. A. D. Baillie, and D. E. Godwin, to No. 17 Sqdn., Hawkinge. 14.7.24. J. W. Colquhoun and H. D. Mitchelmore, to No. 3 Sqdn., Upavon. 14.7.24. H. S. Dawe, to No. 29 Sqdn., Duxford. 14.7.24. F. G. Jennings, to No. 19 Sqdn., Duxford. 14.7.24. A. G. Moon, to No. 111 Sqdn., Duxford. 14.7.24. A. R. Perry, and A. C. Addams, to No. 41 Sqdn., Northolt. 14.7.24. G. H. W. Selby-Lowndes, and H. M. S. Wright, to R.A.F. Base, Leuchars. 14.7.24. A. H. Grace, to No. 99 Sqdn., Birmham Newton. 12.6.24. P. G. Chichester, and E. C. A. Wing, to No. 9 Sqdn., Manston. 14.7.24. D. E. Gain, to No. 99 Sqdn., Birmham Newton. 14.7.24. H. L. R. Gough, J. A. Mollison, C. R. Troup, and H. N. Davies, to No. 24 Sqdn., Kenley. 14.7.24. C. Mackenzie-Richards, and T. R. Wheatley, to No. 15 Sqdn., Martlesham Heath. 14.7.24. G. Terrell, to No. 70 Sqdn., Iraq. 14.5.24.

Pilot Officers.—B. W. Hemsley, to Sch. of Balloon Training, Larkhill; 16.6.24. H. I. Cozens, to No. 56 Sqdn., Biggin Hill; 18.6.24. R. T. Taaffe, to No. 32 Sqdn., Kenley; 18.6.24. N. J. Wiltshire, to No. 29 Sqdn., Duxford; 18.6.24. A. G. S. Tuke, to No. 13 Sqdn., Andover; 25.6.24.

Stores Branch

Squadron Leader: B. W. M. Williams, to H.Q., Iraq. 22.4.24.

Flight Lieutenant: H. S. F. T. Jerrard, to Supply Depot, Palestine. 22.5.24.

Flying Officers: J. London, to No. 47 Sqdn., Egypt. 18.5.24. J. J. T. Rose (Accountant) to Aircraft Depot, Egypt. 16.5.24.

Flying Officers.—E. P. Terry, to C. and M. Party, Donibristle; 4.6.24. R. D. G. Macrostie, M.B.E., to No. 29 Sqdn., Duxford; 23.6.24. C. J. Elliott, to No. 2 Flying Training Sch., Duxford; 23.6.24. C. P. Puckridge (Accountant), to No. 58 Sqdn., Worthy Down; 1.7.24.

Pilot Officers (Accountants).—W. F. Barrell, to No. 13 Sqdn., Andover; 23.6.24. D. F. A. Clarke, to No. 99 Sqdn., Birmham Newton; 23.6.24. J. M. Hopkins, to No. 56 Sqdn., Biggin Hill; 23.6.24. G. R. Keep, to Sch. of Photography, S. Farnborough; 23.6.24. S. C. Wyatt, to Electrical and Wireless Sch., Flowerdown; 23.6.24.

IN PARLIAMENT

Royal Air Force: Accidents in India

CAPTAIN TERRELL, on June 16, asked the Under-Secretary of State for Air whether he will state the accidents, fatal and otherwise, which have occurred in connection with Royal Air Force work in India in each of the last three years; and whether the Indian Government is now fully satisfied that the best possible material is at the service of those who use it?

Mr. Leach: In answer to the first part of the question, the accidents in the Royal Air Force in India involving death or personal injury in the last three years ending on May 31 in each case were:—

1921-22, 7; 1922-23, 4; 1923-24, 14.

It should be added that the number of hours flown was considerably greater in the last year than in the two preceding years combined. In answer to the second part of the question, I cannot answer for the Government of India, but the Air Ministry have supplied the best possible material, and there is no reason to believe that it is not giving satisfaction.

Aerial Pageant

SIR H. BRITAIN on June 19 asked the Under-Secretary of State for Air the number of aeroplanes which will take part in the forthcoming aerial pageant; and whether new features are to be incorporated in it?

Mr. Leach: The answer to the first part of the question is, approximately, 170 aeroplanes; to the second, that new features will comprise:

Flying display by aeroplanes from No. 2 Air Regiment of the French Military Air Service.

Competition in picking up messages from the ground.

Wing flying drill (two squadrons). This is the largest formation hitherto engaged at the pageant.

Air attack on a commerce destroyer by a flight of torpedo aeroplanes, supported by a flight of fighting aircraft.

SIR H. BRITAIN: Are arrangements being made to give overseas visitors now in England an opportunity of seeing this pageant?

Mr. Leach: Yes, we are affording facilities for that purpose.

Mr. P. Harris: What is the purpose of this pageant? Is it for amusement, is it to raise money, or is it for a strategic purpose, or a manoeuvring purpose?

Mr. Leach: A combination of the lot.

Mr. Hardie: At this special display will the public be entertained by the evolutions of the helicopter, which, we understand, is now capable of leaving the ground?

SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Re notice published in FLIGHT on June 12 last.

It has been decided to again postpone the competition for the "D. H. Pilcher" Challenge Cup from June 28 to Saturday, July 12, when it will be held on Wimbledon Common at 3.30 p.m.

The competitions for the Felix Kelly Cup and the Sir John Shelley Cup will be held as stated, on Saturday, June 28, at 3.30 p.m.

Further particulars may be had from the Competition Secretary, Mr. C. Bayard Turner, 27, Ouseley Road, Balham, S.W. 12.

A. E. JONES, Hon. Sec.

This Season's Sporting (Air) Events

SEVERAL interesting announcements are published in the Royal Aero Club official notices appearing on p. 411 in this issue of FLIGHT. It will be seen that of £500 presented to the Racing Fund by Sir Charles Wakefield, £300 goes to the first prize in the Aerial Derby and £100 for the King's Cup Race. Further prizes for the Light 'Plane Competition are also announced, viz.: £150 from the Society of Motor Manufacturers and Traders, and £150 from the British Cycle and Motor-Cycle Manufacturers and Traders' Union. The Grosvenor Cup will be held on the last day of the Light 'Plane Competition, and is to be confined to light 'planes having engines not exceeding 1,100 c.c.

The date of the King's Cup Race has been changed from July 26 to Tuesday, August 12. This alteration is rendered necessary owing to the fact that the Naval Review at Spithead takes place during the first date, consequently Calshot, Lee on Solent, and Gosport will be "full up" with Service aircraft, and the R.A.C. are desirous of in no way interfering with the latter.

"Sadi" Wins Beaumont Cup

SADI LECOINTE not only won the Beaumont Cup Speed Contest, which took place at Istres on Monday, but also broke the world's speed record for 500 kms. held by Alex. Pearson (U.S.A.). The Beaumont race, in which a minimum speed of 290 k.p.h. must be attained, was flown over a course of 300 kms. made up of six laps of 50 kms. each. Of the four entrants, Sadi Lecoinge was the only one to finish—L. Carter, on the Gloucestershire racer (the only British entrant), having withdrawn; M. Lasne, on a 300 h.p. Nieuport-Delage, also withdrew at the last moment, and Lieut. Ferigoule, on a 500 h.p. Salmson-Béchereau, had to retire owing to radiator trouble. Sadi was flying a Nieuport-Delage monoplane (450 h.p. Hispano-Suiza), and "lapped" as follows:—1st, 322 k.p.h.; 2nd, 317 k.p.h.; 4th, 313.85 k.p.h.; 6th, 311.239 k.p.h. His time for the 300 kms. was 57 mins. 50 secs., or 311 k.p.h. He did not land at the end of the 300 kms., but continued on another four laps, making a total of 500 kms., his time for which being 1 hr. 37 mins. 49 secs., or 306 k.p.h. The previous record (Pearson's) was 270 k.p.h. In addition to winning the 75,000 francs prize and Beaumont Cup, Sadi also wins the supplementary prize offered by M. Laurent-Eynac.

Inst. of Aeronautical Engineers Papers.

"MINUTES of Proceedings," No. 8, of the Inst. of Aeronautical Engineers has just been issued, in which are published abstracts of the following two papers read recently before the Inst.: "Three-Ply and Its Uses in Aircraft Construction," by Capt. R. N. Liptrot, B.A., and "The Soaring Flight Question," by Dr. E. H. Hankin, M.A. Each paper is followed by a report on the discussion. Anyone interested in the above two papers may obtain a copy of "Minutes of Proceedings," No. 8, containing same, from the Secretary, Inst. of Aeronautical Engineers, 60, Chancery Lane, W.C. 2. Price 1s. 6d.

Glasgow-Belfast Air Service

THE first of a series of experimental flights for a daily air service between Glasgow and Belfast started last week, the machine used being the D.H.50. This service will probably replace the Belfast-Liverpool air service, which has been suspended on account of the very bad weather conditions prevailing over this route and the unsuitable nature of the terminal aerodromes—apart from which this service had proved to be a popular and successful one.

Staff Officer's Aerial Tour of Inspection

AN interesting example—according to *The Times*—of the way the aeroplane has revolutionised General Staff work is provided by the tour programme of Colonel Saunders, Deputy Director of Military Intelligence, who left Simla on June 21 for Peshawar, whence he is to fly to Sara Rogha. He will

proceed in a motor-car to Tank, and will fly from that place to Dera Ismail Khan, the whole journey from Peshawar taking about six hours. The next day he will fly to Razmak, and after a brief halt will fly to Quetta via Fort Sandeman. He will thus, all being well, accomplish in three days what his predecessors took as many weeks to do.

Saved by Parachute

LIEUT. J. A. MACREADY, the famous American pilot, is reported to have had a narrow escape from death while flying near Dayton one day last week. When at a height of about 1,500 ft. his machine caught fire, but he managed to jump clear of the machine with his parachute and effect a safe landing not far from where the burning aeroplane crashed. Shortly after he joined the horrified crowd in their search for his charred remains amongst the wrecked machine!

Lieut. Pelletier d'Oisy and "Castrol"

It is gratifying to learn that Great Britain has contributed something towards the success achieved by Lieut. Pelletier d'Oisy in his remarkable flight from Paris to Tokio. Messrs. C. C. Wakefield inform us that they have received a cablegram from Lieut. d'Oisy expressing his entire satisfaction with the "Castrol" lubricating oil used by him throughout the entire flight.

PUBLICATIONS RECEIVED

Appendix to Administrative Report, 1923. Relation between Aeronautic Research and Aircraft Design. By J. S. Ames. U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

Reports Nos. 177. The Effect of Slipstream Obstructions on Air Propellers, by E. P. Lesley and B. M. Woods. 182. *Aerodynamic Characteristics of Airfoils—III.* 183. *Analysis of Free Flight Propeller Tests and Its Application to Design* by M. M. Munk. 184. *Aerodynamic Forces on Airship Hulls,* by M. M. Munk. U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

Small Car Trials, 1924. Official Report. The Royal Automobile Club, Pall Mall, London, S.W.1.

The Official Gazette of the United States Patent Office. June 3, 1924. Vol. 323. No. 1. U.S. Patent Office, Washington, D.C., U.S.A.

Catalogue

Efficient Power Transmission. The Hoffmann Manufacturing Co., Ltd., Chelmsford, Essex.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; I.C. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1923

Published June 26, 1924.

- 6,232. FAIREY AVIATION CO., LTD., and F. G. T. DAWSON. Controlling devices for aeroplanes. (216,594.)
- 6,553. L. M. STEEPLE. Rotary i.c. engines. (216,597.)
- 6,933. P. SALMON. Aeroplane wing arrangement. (216,601.)
- 28,351. A. L. BOISSEAU. Apparatus for extinguishing and preventing fires. (216,792.)
- 29,271. A. ROHRBACH. Flying-boats. (208,519.)
- 30,419. SOC. ANON. DES ATELIERS D'AVIATION L. BREQUET. Wheels with spring hub. (208,148.)

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